Edinburgh based rocket is almost ready to roll

A GROUNDBREAKING 3D-printed rocket engine is nearing completion following a successful partnership between two UK businesses.

In what is a major development in the country's new space race, Edinburgh-headquartered Skyrora has worked closely with UK manufacturing company, Frazer-Nash Manufacturing to design and create its upper stage engine.

With a specialist capability in aerospace-grade precision engineering, the Hampshire manufacturing firm has used innovative techniques to create the nickel alloy rocket engine components that will eventually power and manoeuvre Skyrora rockets and payloads once they reach orbit.

Additive manufacturing (AM), also referred to as 3D printing, is a process of creating a 3-dimensional part layer by layer. The process uses a laser to melt a bed of powder to the exact profile of the part, which then repeats until the component is complete.

The process works by adding material to create the desired shape, instead of having to remove material through methods like machining.

Now set for final stage testing, the engine illustrates just how advanced preparations now are, for what could become the UK's first commercial orbital rocket launches.

Robin Hague, Lead Engineer with Skyrora, said: "Creating this engine with Frazer-Nash is a big step forward for us – and in

turn for the UK's new space-race.

"Frazer-Nash has been instrumental in the design and manufacturing process of our upper stage engine and is helping us to create a prototype that is scalable – thanks to the advanced 3D printing technology.

"We are committed to supporting the UK space industry and so localising our supply chain has always been a top priority for us.

"The completion of the manufacturing process marks a milestone in our development process, with the engine scheduled for upcoming tests at Cornwall Airport Newquay."

The engine is scheduled for testing over the coming weeks at Spaceport Cornwall – and will represent the first advanced liquid-fuel engine tests by a British small-satellite launcher to take place in the UK – since the legendary Black Arrow programme in the 1960s.

Andy Brooker, AM Development Manager with Frazer-Nash Manufacturing, said: "We have been involved with metal 3D-printing for over five years. Along with our extensive machining capabilities, we are able to supply our customers with a complete package from under one roof.

"We have always been at the forefront of engineering, and are one of the first companies to obtain AS9100 aerospace approval for AM components.

"This is a very exciting time to be at the centre of such an innovative project – the space industry has exploded over the past few years, with more traditional companies now viewing additive manufacturing as a means to lowering payload weight.

"There is still a dearth of UK-based space companies and with much of the production centred in the US, we are very grateful for the opportunity to be involved with a UK company – it'll

be great to launch an engine with a ‘Made in Britain’ sticker.”

Skyrora’s rapidly expanding team aims to capture its share of the fast-growing small satellite launch market and has already created two separate prototype engines, one of which is scheduled for testing at Cornwall Airport Newquay in the coming weeks.

It is developing launch vehicle technology that builds on previous British launch heritage from programmes such as Skylark and Black Arrow, with the aim of reducing the cost of launches thanks to the combination of proven technology and advanced engineering methods.

The firm draws on Britain’s launch heritage and aims to build a robust supply chain while creating new employment opportunities to inspire the next generation of talent.